BISS Biodiversity Information Science and Standards

Biodiversity Information Science and Standards 10: e183654
doi: 10.3897/biss.10.183654

OPEN ACCESS

Conference Abstract

The Disentis Roadmap: A Decadal Roadmap for Liberating Global Biodiversity Knowledge from Scientific Literature

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Received: 27 Dec 2025 | Published: 06 Jan 2026

Citation: Agosti D, Benichou L, Hirsch T (2026) The Disentis Roadmap: A Decadal Roadmap for Liberating Global Biodiversity Knowledge from Scientific Literature. Biodiversity Information Science and Standards 10: e183654. https://doi.org/10.3897/biss.10.183654

Abstract

Published biodiversity research—from species descriptions and traits to distributions, interactions, and drivers of change—remains largely locked in inaccessible literature and electronic resources (Uetz and Agosti 2024, Uetz and Agosti 2025). This constitutes a major barrier to scientific progress and evidence-based policy (Fuller et al. 2014). It also limits the benefits arising from the dramatic explosion of available data through recent advances in digitisation and sharing of data from natural history collections, citizen science networks, monitoring programmes including environmental DNA (eDNA) sampling, and environmental impact assessments, among other sources. Making biodiversity knowledge openly available through connected, curated, and digitally accessible cross-domain knowledge bases is both a pressing challenge and a critical opportunity for the global research and policy communities. The Disentis Roadmap, a decadal strategy for liberating global biodiversity knowledge from scientific literature, emerged from a symposium held in Disentis, Switzerland, in August 2024, which assessed the impact of the 2014 Bouchout Declaration and identified strategic priorities for the coming decade. As of November 13, 2025, the Roadmap has been signed by 107 entities, comprising 74 individuals and 33 institutions. Discussions were grounded in existing workflows for data liberation (Fig. 1), involving a collaborative effort among key

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stakeholders: publishers (EJT, Muséum national d'Histoire naturelle Paris, Pensoft), Plazi the Biodiversity Literature Repository at Zenodo, the Global Biodiversity Information Facility (GBIF), ChecklistBank, and the Biodiversity PubMedCentral hosted by the Swiss Institute of Bioinformatics Library Services (SiBILS). These efforts include the automated conversion and reuse of (as of August 2024) 198 biodiversity journals, resulting in substantial open Findable, Accessible, Interoperable and Reusable (FAIR) outputs from 95,000 publications, including 760,000 taxonomic treatments, 630,000 figures, and 1.7 million material citations available as open FAIR data in the Biodiversity Literature Repository at Zenodo and TreatmentBank. This insight to the data included in publications enables novel views of articles such as dashboards (Fig. 2, Bénichou et al. 2021) and also opens the door to create alternative research assessments (e.g. Declaration on Research Assessment (DORA). Additional input has been provided through the extensive digitization and annotation of historic texts through the Biodiversity Heritage Library (BHL), as well as the efforts of a large number of individual scientists and research groups such as Taxodros. Use cases have informed the process, including demonstration of literature reuse for assessments of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), annotation with reference vocabularies and mining of biotic interactions at Biodiversity PMC, extraction of relevant evidence from literature for the Global Mountain Biodiversity Assessment, and the expansion of ChecklistBank as a joint initiative of GBIF and the Catalogue of Life (CoL) with highly automated, real-time input of data from new scientific publications.

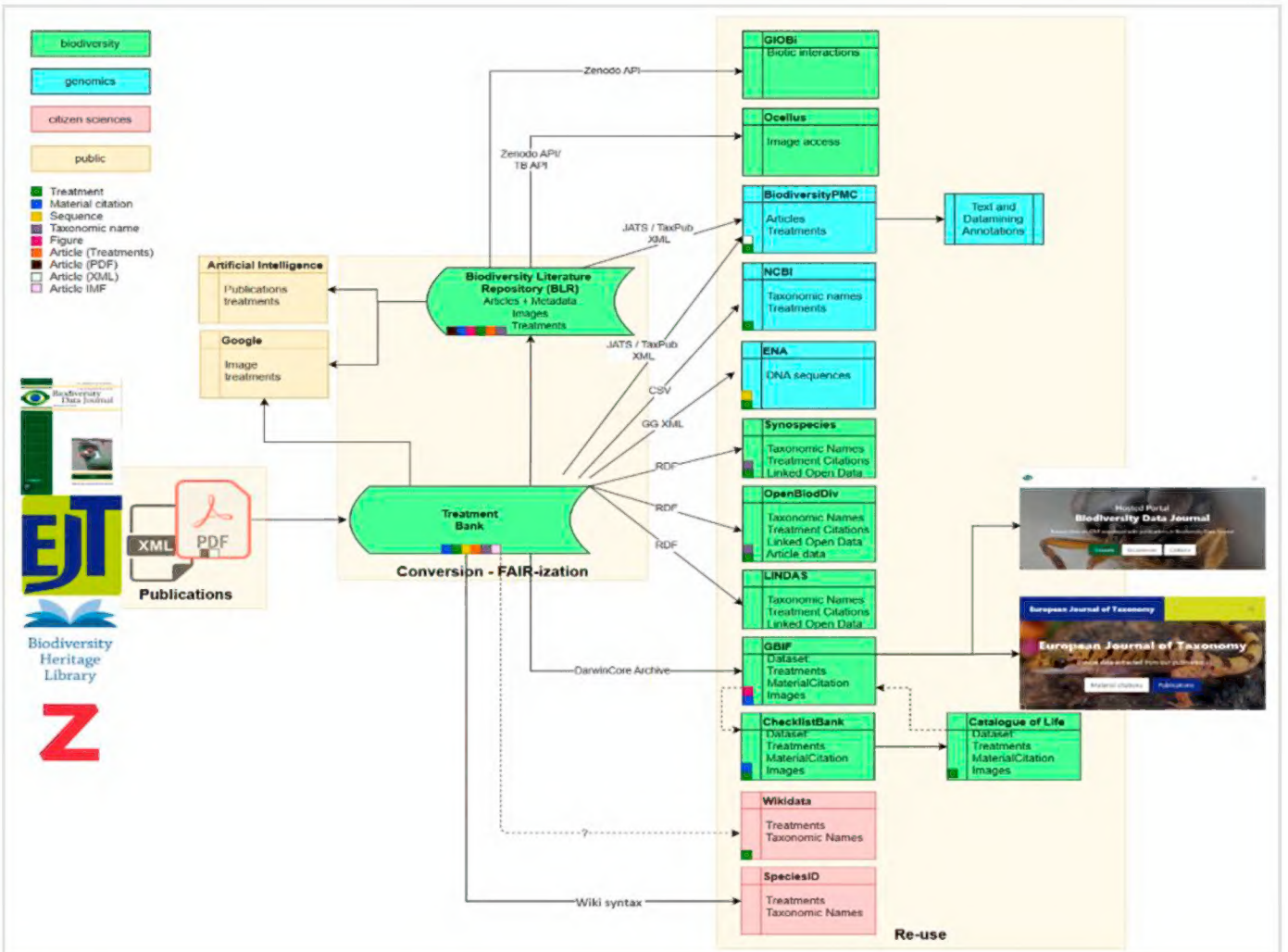

Figure 1.

Steps towards the construction of a 'libroscope'. Figure courtesy of Plazi. CC-BY 4.0.

Figure 2.
Dashboard based on the author's affiliations and institution locations listed in material citations (citation of specimens used in the research) liberated from 10 years of *European Journal of Taxonomy* publications (Bénichou et al. 2021). CC-BY 4.0.

The signatories of the roadmap have given their support to an ambitious set of outcomes to be delivered over the next decade:

- 100% of major public biodiversity research funders and academics publishers to enforce and enable FAIR data publication
- Biodiversity publications to be accessible in machine-actionable formats, with all non-copyrightable parts of articles flowing into publicly-accessible repositories, thereby streamlining the re-use of this knowledge for further research, for science policy platforms such as IPBES, and ultimately for the wider public.
- Published research on biodiversity will be 'fully AI ready,' i.e., openly available for AI training and properly labelled for ingestion by machine-learning models, based on well-curated and semantically structured data, within appropriate ethical and legal frameworks.
- A dedicated portion of biodiversity-related research and infrastructure funding will be allocated towards ensuring that the above goals regarding access to biodiversity data and knowledge are met.

The roadmap proposes creating a 'Libroscope,'*[1] through large-scale deployment of an established workflow by participating organisations, which will overcome existing barriers

to the discovery and re-use of biodiversity data and knowledge currently ‘trapped’ in publications.

Among the short to medium term actions proposed for advancing the Libroscope concept are:

- Developing a set of empirical use cases to demonstrate the value of biodiversity data liberation based on actual needs of researchers and policy makers.
- Developing minimum standards for machine-actionable publications to benchmark the extent of knowledge ‘liberation’ contained in different biodiversity publications.
- Building efficient workflows through existing research infrastructures to ensure sustainable access to open biodiversity knowledge, including establishment of appropriate governance, funding and legal frameworks.
- Establishing links with collection data infrastructures such as Distributed System of Scientific Collections (DiSSCo) and Integrated Digitized Biocollections (iDigBio), recognising that the role of specimens is crucial to permanently link research data and enable faster biodiversity description.
- Developing a global training programme on how to maximise the re-usability of biodiversity research publications, focusing on the value of liberating biodiversity data.

Becoming a signatory to the Disentis Roadmap is highly encouraged.

Keywords

FAIR, biodiversity informatics, publishing, data liberation

Presenting author

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Presented at

Living Data 2025

Conflicts of interest

The authors have declared that no competing interests exist.

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Endnotes

*1 The Biodiversity Libroscope envisioned is a mechanism for unlocking and linking data from scientific literature to support understanding of biodiversity, as the microscope and telescope previously revolutionized science. The plan largely builds on existing technology and workflows, and does not rely on construction of a new technical infrastructure.